

PATENT

REMARKS:

Claims 1-20 were pending and considered. Claims 1-20 were rejected. In response, claims 4, 8, 9 and 12-16 have been cancelled, and claims 1, 5, 17 and 20 have been amended. Following entry of this amendment, claims 1-3, 5-7, 10, 11 and 17-20 remain pending. Reconsideration and allowance are respectfully requested.

Claims 1-20 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 6,041,899 (Takamatsu). In response, claims 4, 8, 9 and 12-16 have been cancelled and claims 1, 5, 17 and 20 have been amended. Accordingly, Applicant is of the opinion that the remaining claims recite an invention not taught or suggested by Takamatsu, and provides advantages over the prior art

Takamatsu discloses a rotary controlled damper including a rotor 17 with a spur gear 15 and a plurality of coaxial rotary cylindrical bodies 16 provided on a lower base of spur gear 15. Bodies 16 open downwardly. A stator 20 comprises a base 18 and a plurality of coaxial stationary cylindrical bodies 19 on an upper face of base 18 that engage cylindrical bodies 16. Cylindrical bodies 19 open upwardly (column 3, lines 53-65). An engaging groove 25 is provided in base 18 of stator 20 outside an outer cylindrical body 20. Engaging groove 25 has eight portions alternately designated X, Y divided in a peripheral direction by a uniform distance of 45°, as shown in Fig. 3. An engaging protrusion 26 includes protrusion portions provided at the alternately divided portions X, Y as shown in Fig. 3. Engaging protrusion 26 comprises an inward downward inclination face 26B downwardly inclined in an inward direction from a vertical face 26A, as shown in Fig. 2 (column 4, lines 50-64). Oil storage grooves 27 are provided on an upper face of base 18 and positioned to receive and contain oil overflow from the space between cylindrical bodies 16 and 19 (column 5, lines 10-21). In an embodiment shown in Fig. 9, engaging protrusion 26 has a horizontal face 26C and not the inward downward inclination face 26B. A corner of horizontal face 26C and vertical face 26A engage the upper downward inclination face 24A of protrusion 24 (column 6, lines 45-57). In another embodiment shown in Fig. 10, annular protrusion 24 has a horizontal face 24C instead of upward downward inclination face 24A. A corner of horizontal face 24C and the inward, downward inclination face 24B of rotor 17 engage

PATENT

inward downward inclination face 26B of engaging protrusion 26 of stator 20 (column 6, lines 58-67).

As described and shown in the drawings, Takamatsu includes distinct peripheral portions in groove 25 and on protrusion 26, eight such segments are disclosed and shown spaced from each other. The protrusion and groove provide flat, angular faces that engage one against the other. Oil storage grooves are required for oil overflow. The rotatable part and the fixed part each have a plurality of walls that interleave one with the other. The rotatable part is disposed within the fixed part, with an outer wall of the fixed part radially outward of the rotatable part.

In contrast to the teaching of Takamatsu, claim 1 as amended recites features different from Takamatsu, including "a single wall" extending from the base, and the rotatable part having a "rim extending outward beyond said wall". Claim 1 further recites, the "wall including a radially extending rounded lip extending continuously around said wall, and said rim defining a curved recess for receiving said lip, said rim defining a continuous edge along said recess for engaging said lip". With respect to the damping fluid contained in the damper, claim 1 recites, "damping fluid compressed in the space between said first and second parts including between said rounded lip and said curved recess and contained therein by a seal formed by said edge against said lip."

In further contrast to the teaching of Takamatsu, claim 17 as amended recites, "a fixed first part having a base and a single wall extending outwardly from said base," and the wall having an open end with "a round lip projecting outwardly at said open end". The rotatable second part is recited to have a "rim extending over and outwardly beyond said wall open end". The rim is recited to have "a thickened end of a diameter greater than a diameter of said wall and less than a diameter of said lip," with the thickened end "disposed between said lip and said base outwardly of said wall".

Takamatsu does not teach or suggest a single wall, a radially extending rounded lip continuously around the wall, a rim of the rotatable part extending outwardly beyond the single wall of the fixed part, or a curved recess for receiving the lip, with the rim defining a

PATENT

continuous edge along the recess for engaging the lip, all as recited in amended claims 1 and 17. Takamatsu does not teach or suggest damping fluid compressed between a rounded lip and a curved recess and contained therein by the seal formed by the edge against the lip, as recited in amended claim 1. Takamatsu does not teach or suggest a thickened end of a rim having a diameter greater than the wall and less than the lip and disposed outwardly of the wall between the lip and the base, as recited in amended claim 17. The present invention provides a rotary damper that is easily assembled yet effectively seals to contain damping fluid therein, with damping fluid acting as a lubricant between all confronting surfaces except for a seal of minimum radial extent. The present invention thereby provides a damper having reliable performance. Accordingly, Applicant respectfully submits that claims 1 and 17 are not taught by or obvious from the disclosure of Takamatsu. Reconsideration and allowance of claims 1 and 17 respectfully are requested.

Claims 2, 3, 5-7, 10 and 11 depend from claim 1 and include all of the limitations thereof while adding further specificity to the invention recited therein. Accordingly, Applicant respectfully submits that claims 2, 3, 5-7, 10 and 11 are allowable together with claim 1 from which they depend. Claims 18-20 depend from claim 17 and include all of the limitations thereof while adding further specificity to the invention recited therein. Accordingly, Applicant respectfully submits that claims 18-20 are allowable together with claim 17 from which they depend.

Claims 1 and 7-16 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent 6,604,614 (Kurihara et al.). In response, claims 8, 9 and 12-16 have been cancelled, and claim 1 has been amended. Accordingly, Applicant respectfully submits that claim 1 recites an invention neither taught nor suggested by Kurihara et al. and provides advantages over the prior art.

Kurihara et al. discloses a rotary damper D including a housing 21 and a rotor 28. O-shaped rings 32, 33 are provided as sealing members for sealing between rotor 28 and housing 21. A viscous fluid 35 fills a space 34 formed between housing 21 and rotor 28 (column 3, lines 15-23).

PATENT

It is respectfully submitted that Kurihara et al. fails to teach any of the structure recited in claim 1 discussed above with respect to the rejection based on Takamatsu. Kurihara et al. fails to teach or suggest a radially extending rounded lip continuously around the wall, a rim of the rotatable part extending outwardly beyond the single wall of the fixed part, or a curved recess for receiving the lip, with the rim defining a continuous edge along the recess for engaging the lip to contain the oil compressed between the first and second parts, all as recited in amended claim 1. Instead, Kurihara et al. uses conventional O-ring seals for closing the damper. Kurihara et al. does not teach or suggest damping fluid compressed between a rounded lip and a curved recess, as recited in claim 1. The present invention provides a rotary damper that is easily assembled yet effectively seals to contain damping fluid therein, with damping fluid acting as a lubricant between all confronting surfaces except for a seal of minimum radial extent. The present invention thereby provides a damper having improved, reliable performance. Accordingly, Applicant is of the opinion that claim 1 is neither taught nor suggested by the teaching of Kurihara et al. and should be allowed. Claims 7, 10 and 11 depend from claim 1 and include all of the limitations thereof. Accordingly, Applicant respectfully submits that claims 7, 10 and 11 also should be allowed.

Claims 2-6 and 17-20 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara et al. in view of U.S. Patent 4,869,125 (Saigusa). In response, claim 17 has been amended. Accordingly, Applicant is of the opinion that claims 2-6 and 17-20 recite an invention not suggested by the prior art, which includes advantages over the prior art.

Claims 2-6 depend from claim 1 and include all of the limitations thereof while adding further specificity to the invention recited therein. Since claim 1 is believed to be allowable for the reasons stated above and has not been rejected on any other basis not already addressed above, it is respectfully submitted that claims 2, 3, 5 and 6 are allowable in that they depend from an allowable independent claim.

With respect to the rejection of claims 17-20, the teaching of Kurihara et al. has been summarized above. Saigusa teaches a rotary oil damper having a cylindrical body 10 and a rotary member 12. As with the teaching of Takamatsu, Saigusa teaches rotary member 12

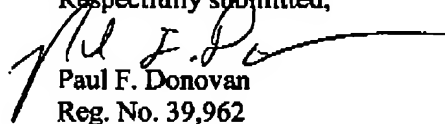
PATENT

disposed within the stationary cylindrical body 10. As shown in Fig. 3, Saigusa appears to teach substantially flat extended surfaces between the rotary part and the stationary part engaging along at least three surface segments.

Neither Kurihara nor Saigusa, alone or in combination teach or suggest a rotatable part having a cover and an outer rim, with the rim extending over and beyond a wall defined by the fixed part, as recited in claim 17. Neither Kurihara nor Saigusa, alone or in combination teach or suggest the wall having a rounded lip projecting outwardly and the rim having a thickened end of a diameter greater than a diameter of the wall but less than a diameter of the lip, with the thickened end disposed between the lip and the base outwardly of the wall, as recited in claim 17. Neither Kurihara nor Saigusa, alone or in combination teach or suggest a continuous sliding seal of limited radial width as recited in claim 17. The present invention provides a rotary damper that is easily assembled yet effectively seals to contain damping fluid therein, with damping fluid acting as a lubricant between all confronting surfaces except for a seal of minimum radial extent. The present invention thereby provides a damper having improved, reliable performance. Accordingly, Applicant respectfully submits that claim 17 recites an invention not taught by Kurihara or Saigusa alone or in combination, and claim 17 should be allowed. Claims 18-20 depend from claim 17 and should be allowed together with the independent claim from which they depend.

No new matter has been added by way of the amendments and remarks made herein. Reconsideration and allowance of all the remaining pending claims are respectfully requested. In the event that there are any issues that can be expedited by telephone conference, the Examiner is invited to telephone the undersigned at the number indicated below.

Respectfully submitted,



Paul F. Donovan
Reg. No. 39,962

Illinois Tool Works Inc.
3600 West Lake Avenue
Glenview, Illinois 60026-1215
(847) 657-4075
FAX (847) 724-4160